City of St. Charles

Summary Report
Ice Bear Demonstration Project

verdeenergyusa

verdeenergysolutions

Municipal Water Treatment Laboratory

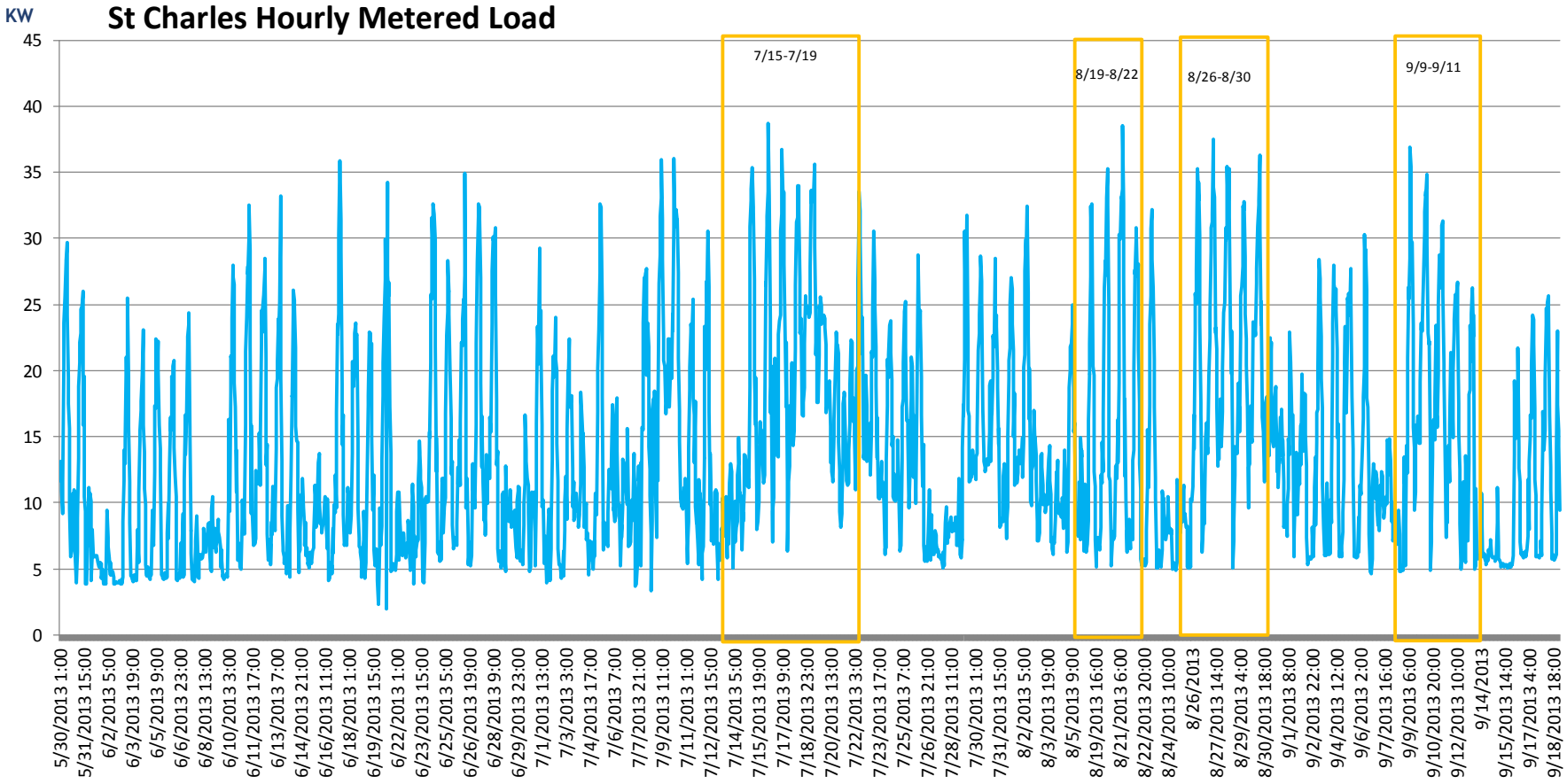
February 27, 2014

Executive Summary

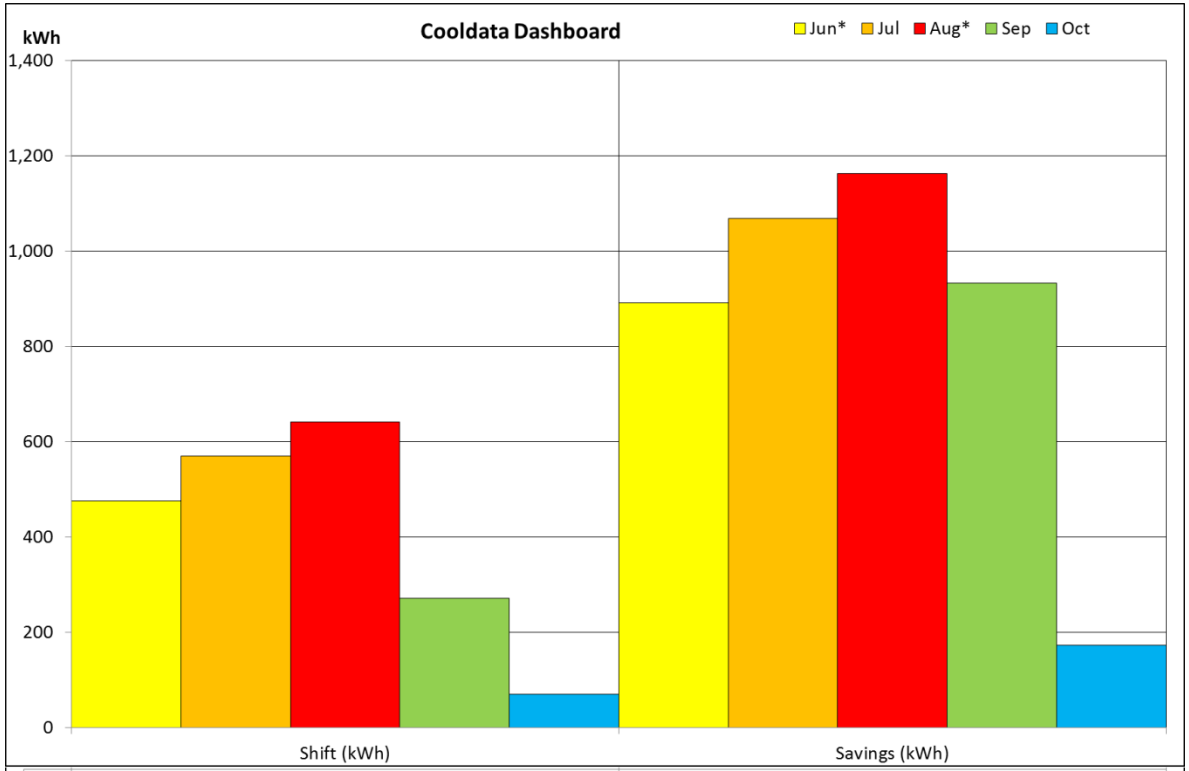
This report summarizes the results of an innovative clean technology demonstration project with Verde Energy Solutions using thermal energy storage. The results of the project show:

- A 95% reduction in HVAC electricity use during peak demand hours was achieved, resulting in energy savings for the City. The project findings are consistent with those achieved by large-scale deployments of such technology across the country.
- Deployment of the technology on a larger scale can further reduce a building's peak load contribution, thus resulting in lower capacity charges in the longer run.

St Charles Hourly Metered Load Overview



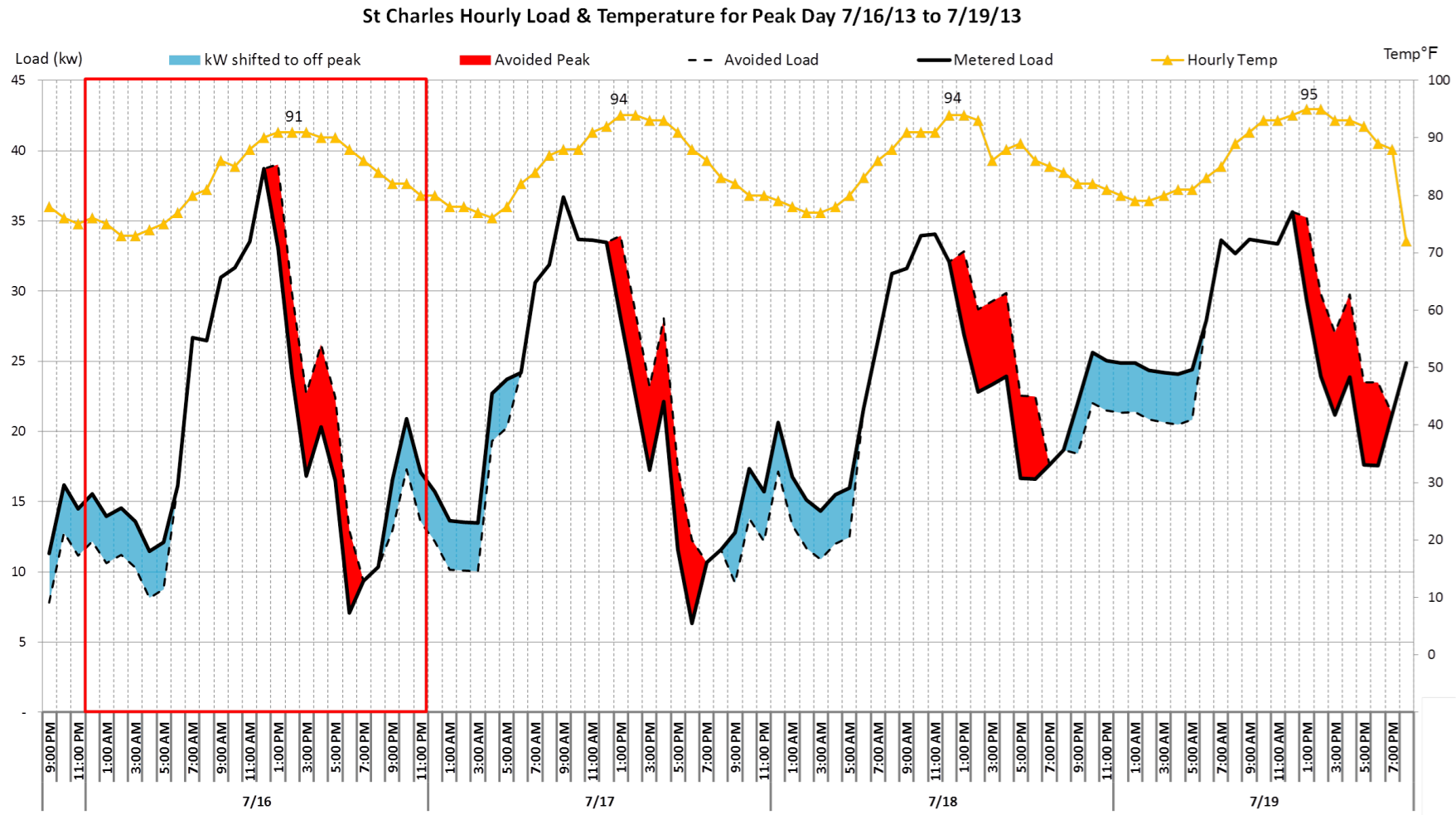
St Charles Monthly Kwh Shift & Savings



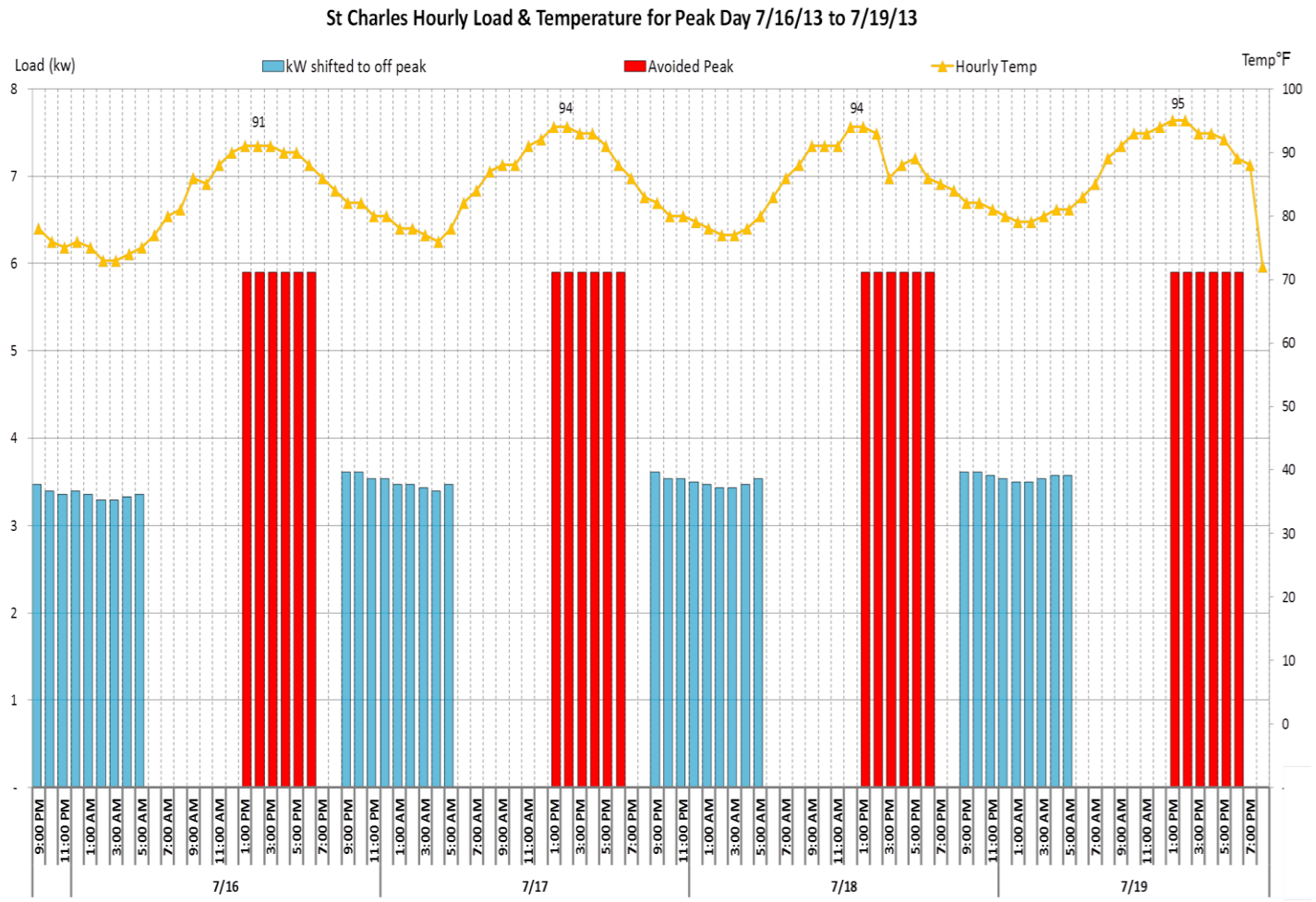
	Shift (kWh)	Savings (kWh)
Jun*	476	892
Jul	570	1068
Aug*	641	1164
Sep	272	934
Oct	71	173
Total	2030	4231

*** Data approximated**

St. Charles - July 2013 Heat Period



St. Charles - July 2013 Heat Period – Load Shift

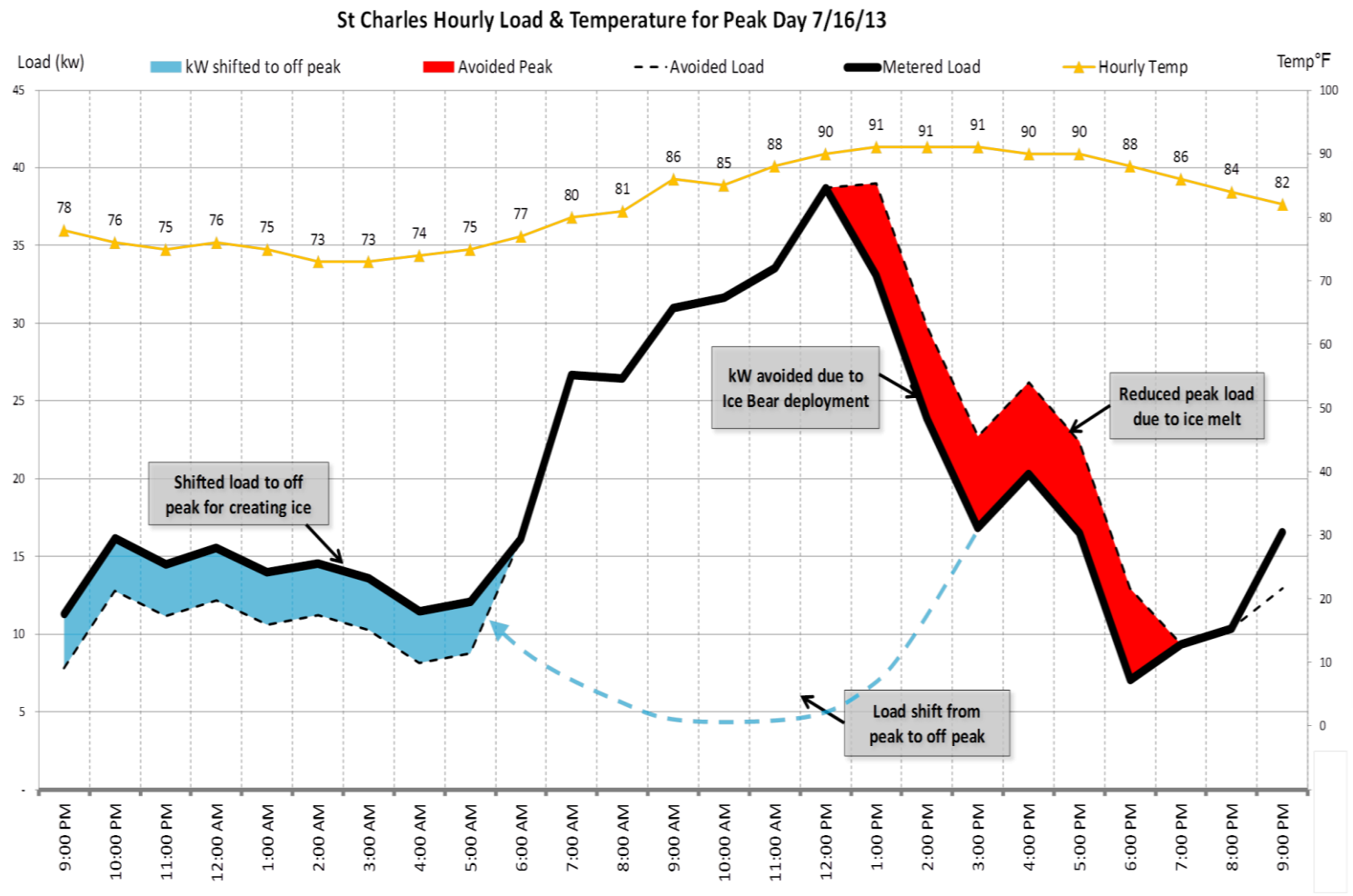


Blue bars represent consumption during off-peak periods when ice storage charges.

Red bars represent electricity consumption avoided during peak hours as a result of using the ice stored energy.

Consistent electricity consumption avoidance during peak hours can permanently reduce a building's peak capacity.

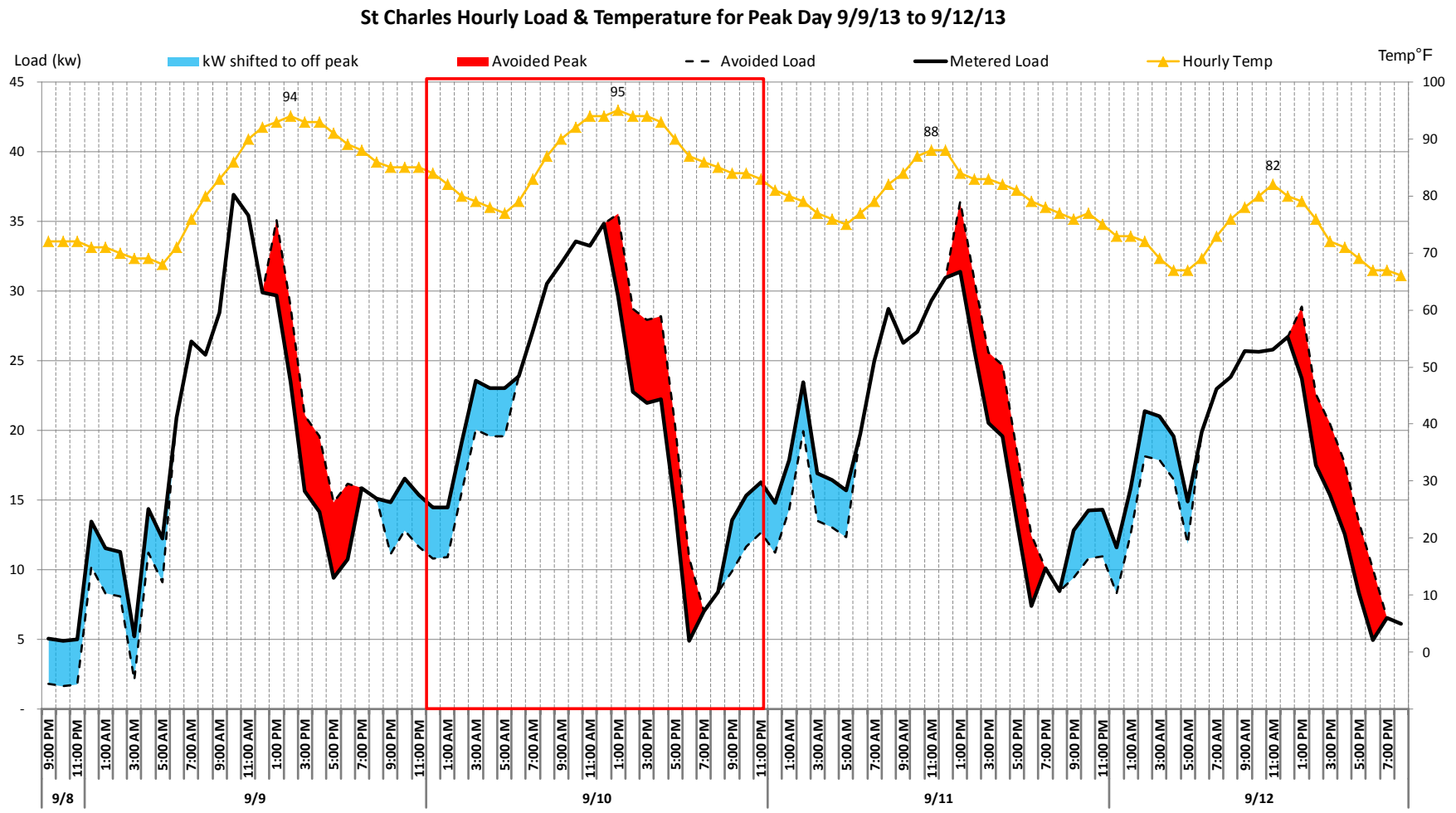
St. Charles - Peak Day July 16, 2013



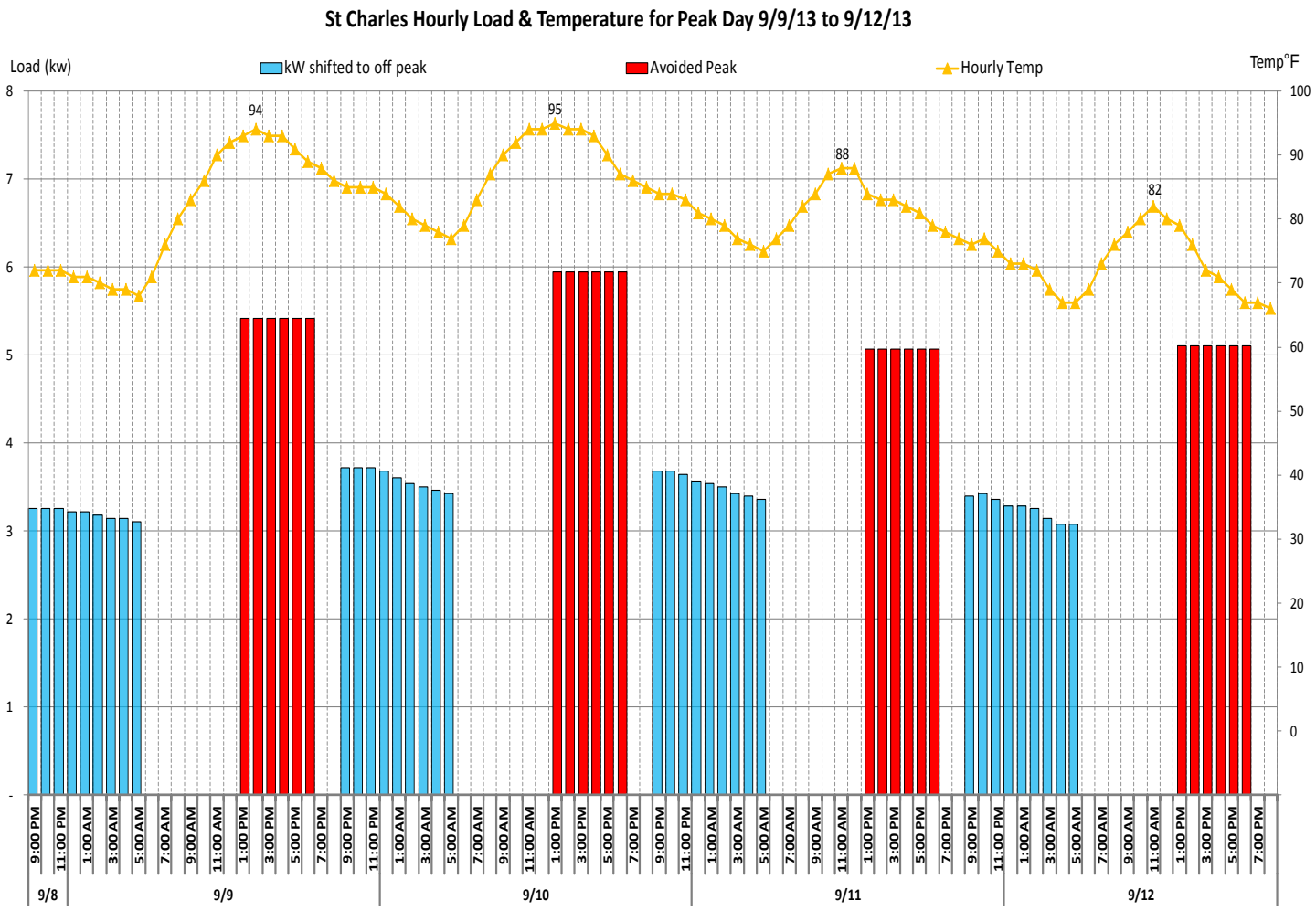
The Ice Bear was set to discharge the stored ice over a daily 6 hour period from 1-7pm.

Daily meter load reflects electricity load shift from peak period (red shaded area) to off-peak (blue-shaded area).

St. Charles - September 2013 Heat Period



St. Charles - September 2013 Heat Period – Load Shift



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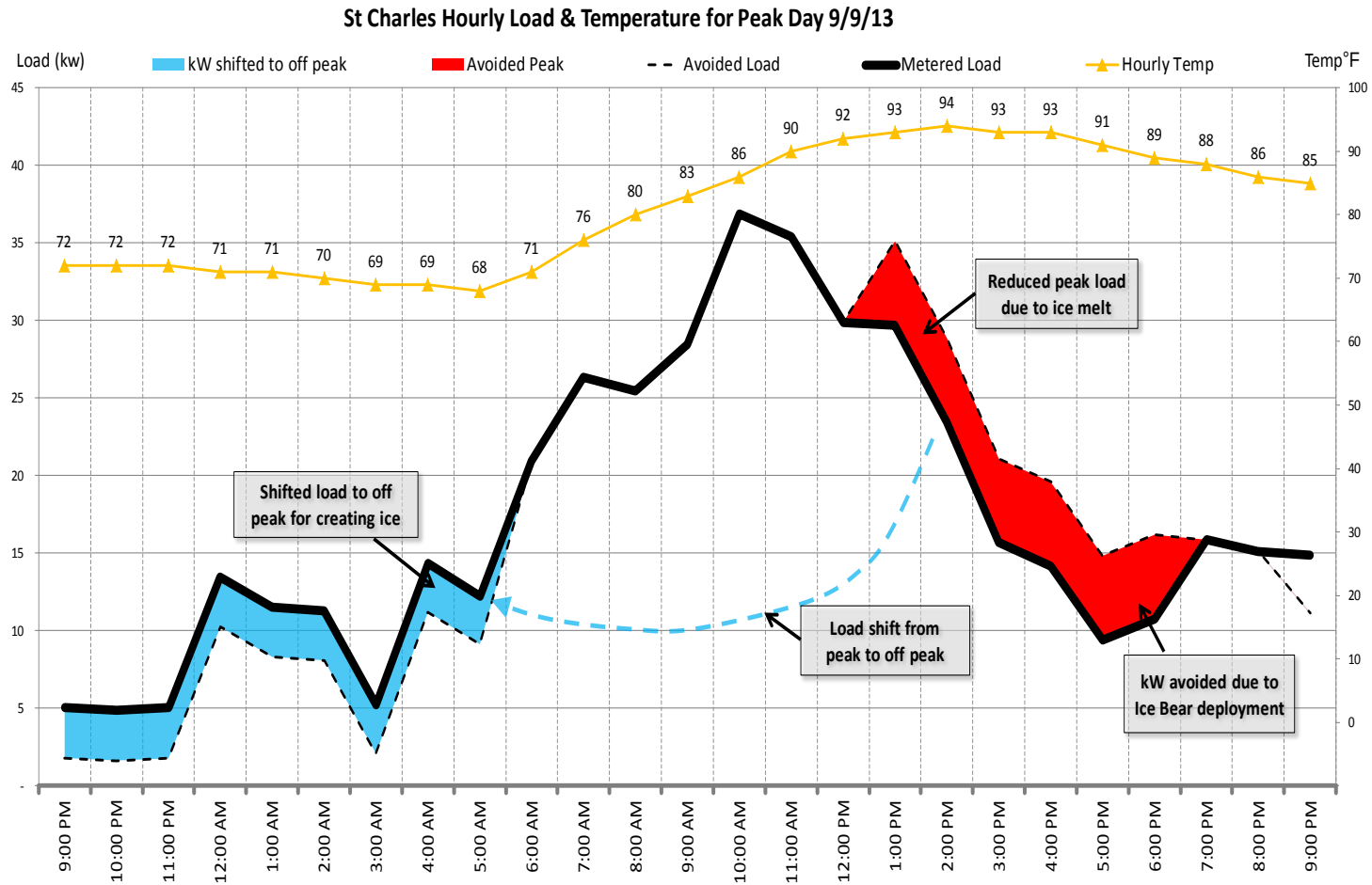
St. Charles - Peak Day September 9, 2013



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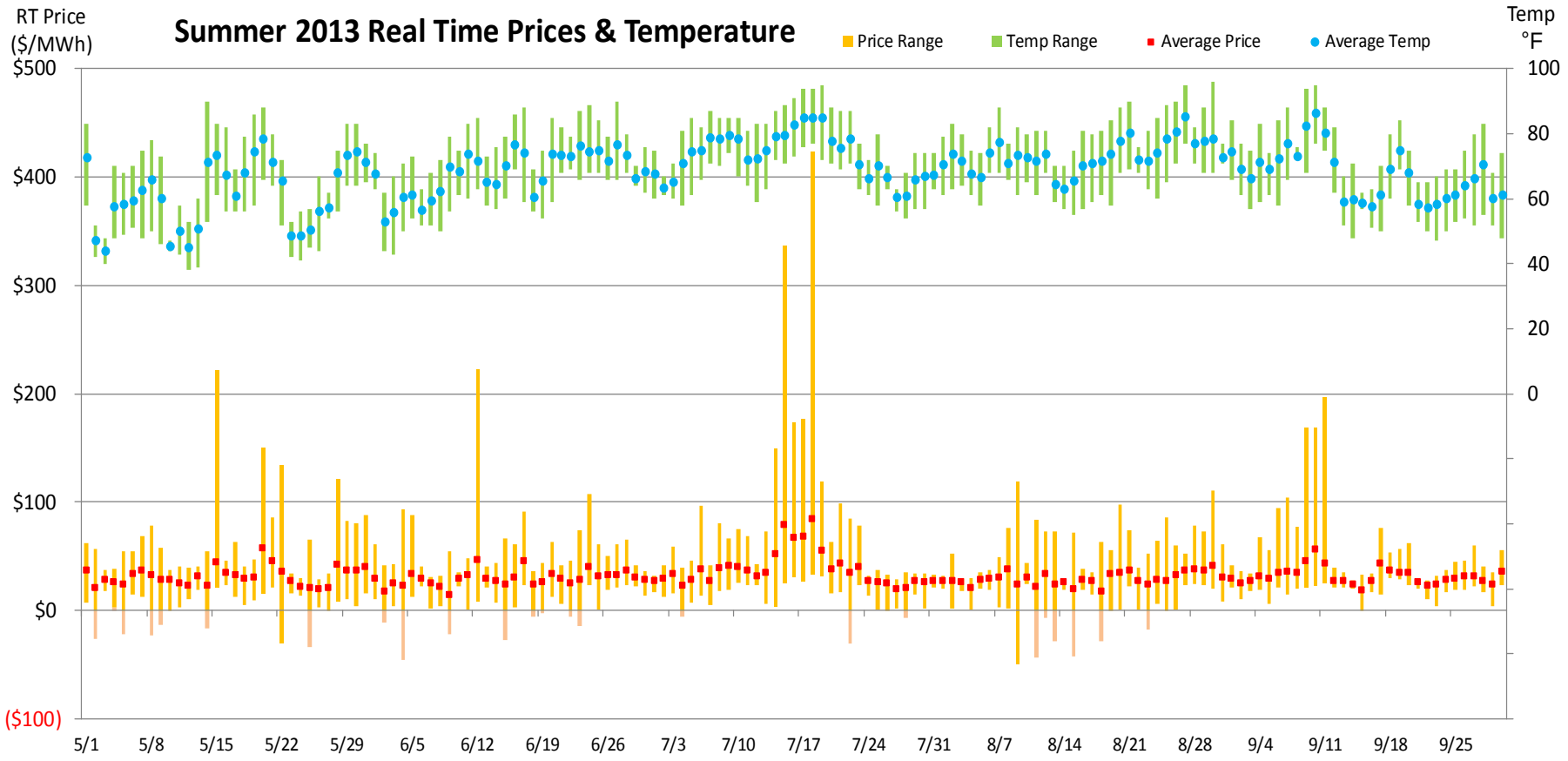
Daily Market Pricing & Temperatures



Ice Bear Technology "In the News"

Ice Energy Selected as Top Ten Innovator

October 30, 2013

Ice Energy, a provider of distributed energy storage and smart grid solutions, was named as a top ten company in Lux Research's Top Innovators from Q3 2013.

Selected by analysts, the list recognizes companies whose performances indicated a "near-term growth opportunity" that large companies could capitalize on across energy and other industries. The list was developed from a number of factors and resources including:

- Primary research
- Expertise of Lux Research analysts
- The "Lux Take" score ranging from "Strong Caution" to "Strong Positive" to provide a bottom-line rating of contenders

"After ten years and 15 million hours of energy storage delivered, it's great to be at this point where Ice Energy is able to be used innovatively in ways that meet utility needs for storage," said Mike Hopkins, Ice Energy EVP Corporate Development & Legal.

The recognition from Lux Research comes on the heels of Ice Energy recently winning the Innovation Award from Energy Storage North America (ESNA) for a Thermal Energy Storage program with the Southern California Public Power Authority (SCPPA), which involves Ice Bear installations at 200 customer facilities, totaling 2.5. MW, or 15 MWh of rated capacity to the grid.

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Ice Energy and Southern California Public Power Authority Recognized with Energy Storage North America's Innovation Award

September 25, 2013

Ice Energy, a leading provider of distributed energy storage and smart grid solutions, has been recognized with the Innovation Award from Energy Storage North America (ESNA) for a Thermal Energy Storage program with the Southern California Public Power Authority (SCPPA).

The joint Ice Energy and SCPPA program involves Ice Bear installations at 200 customer facilities, totaling 2.5MW, or 15MWh of rated capacity to the grid. The units provide optimal efficiency by shifting energy demand to off-peak hours, thereby reducing peak energy consumption and saving significantly on operating expenses.

The theme for this year's ESNA awards was "Multiple Value Streams," and targeted energy storage projects that offered the most benefits in multiple areas for customers across North America. Winners of the Innovation Award were chosen based on four key criteria, including:

- Services provided to the grid,
- Financing options,
- Ownership model, and
- Technology strengths.

Mike Hopkins, Ice Energy EVP Corporate Development & Legal, said, "We are honored to be recognized for our thermal energy storage project with SCPPA. The award serves as a testament to the Ice Bear's continued success as one of the greenest, most cost efficient, and most reliable energy storage solutions."

In particular, Ice Energy and SCPPA were praised for their innovative use of a 'utility-owned-behind-the-meter' business model. To learn more about the ESNA Innovation Award and the additional 2013 winners, view the ESNA official winners announcement.

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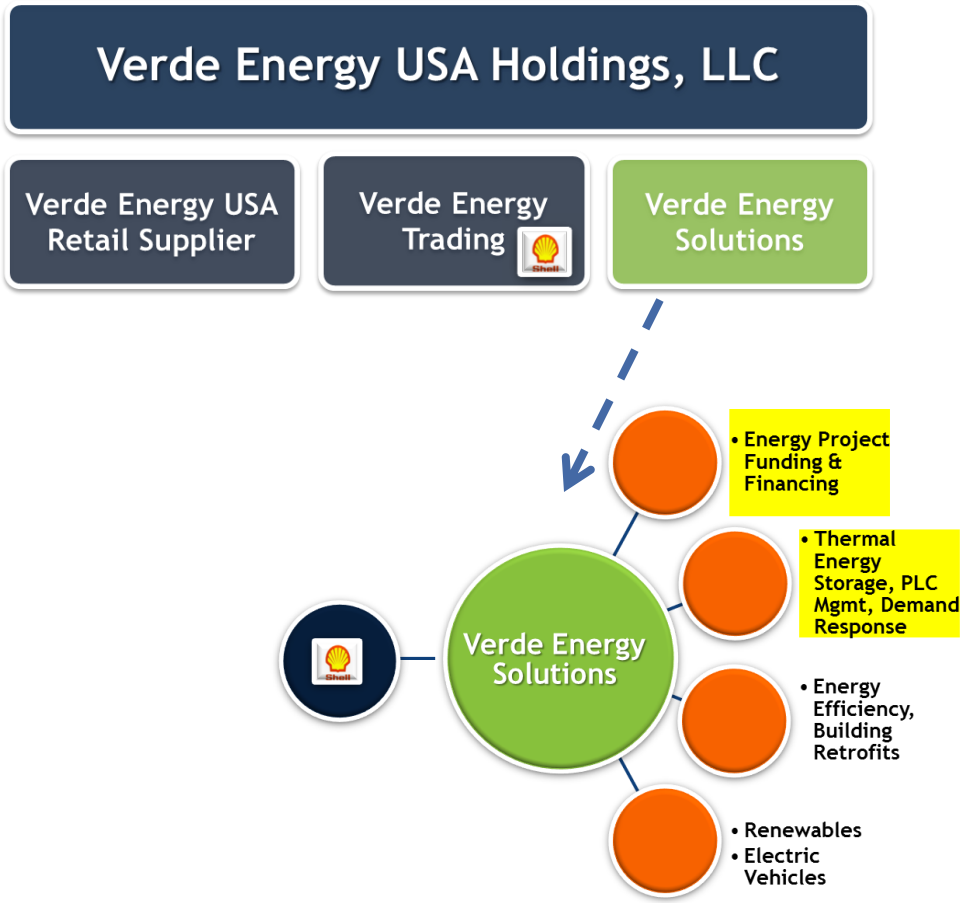
About Us



Verde Energy USA is a Retail Energy Supplier focused on the residential and small to mid-size commercial power markets.

Through Verde Energy Solutions, its wholly-owned subsidiary, Verde aims to broaden and accelerate the adoption of state-of-the-art clean energy technologies.

Headquartered in Norwalk, Connecticut, Verde Energy USA has grown into the 15th largest retail energy retailer in the nation and serves customers in Connecticut, New Jersey, Pennsylvania, Illinois, Ohio, New York, Massachusetts, and Maryland markets. For more information, visit www.verdeenergyusa.com.

Thank You for the Opportunity

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